

Preliminary Report  
Tropical Storm Fernanda  
17 - 22 August 1999

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a. Synoptic history

The origins of Fernanda can be traced to a tropical wave that emerged from the coast of Africa on 1 August. The wave generated little convection as it moved across the Atlantic and Caribbean. On 10 August, convection increased as the system crossed Central America into the eastern Pacific Ocean. Further organization was slow and gradual as the wave continued westward, with the first Dvorak satellite intensity estimates being made on 15 August. Satellite animation showed increasing low-level circulation on 16 August, and scatterometer data from the ERS-2 satellite indicated a well-defined surface circulation with near 25 kt winds near 0600 UTC 17 August. It is estimated that Tropical Depression Ten-E formed at this time (Table 1) about 400 nm south-southwest of Socorro Island, Mexico.

Further intensification occurred, and the cyclone reached tropical storm strength on 18 August while centered 450 nm southwest of Socorro Island. Fernanda reached a peak intensity of 55 kt the next day, followed by weakening as the storm encountered colder water. The peak intensity was coincident with a turn from a west-northwest to a west-southwest track which persisted for the rest of the cyclone's life. While this track carried the storm over warmer water, increasing easterly wind shear caused continued weakening. Fernanda weakened to a tropical depression on 21 August and dissipated as a tropical cyclone on 22 August. The remnant low cloud swirl persisted and turned back to the east, finally losing its identity about 250 nm west-southwest of Socorro Island on 28 August.

b. Meteorological statistics

The "best track" of Fernanda is given in Table 1 and Figure 1. Figures 2 and 3 show the best track maximum sustained (1 min average) surface (10 m elevation) wind speed and minimum central pressure, as well as the associated observations. These include Dvorak technique position and intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the NOAA/NESDIS Satellite Analysis Branch (SAB), and the Air Force Weather Agency (AFGWC in the figures).

In addition to helping determine when Fernanda first developed, the ERS-2 satellite was used to determine tropical storm wind radii.

There are no known surface observations of tropical storm force winds.

c. Casualty and Damage Statistics

Fernanda remained at sea throughout its lifetime, and there are no reports of damage or casualties.

#### d. Forecast and Warning Critique

Since Fernanda was a tropical storm for less than 72 hr, no verification statistics are available for that time. The NHC official average track forecast errors were 38, 80, 98 and 98 nm at 12 (10 cases), 24 (8 cases), 36 (6 cases) and 48 hr (4 cases) respectively. These errors compare favorably to the 1988-1997 average of 39, 71, 105 and 137 nm at those times. The GFDL model had a lower average error than the official forecasts at the 12, 24 and 36 hr periods.

NHC intensity forecast errors were generally less than the 1990-1997 average except at 48 hr. There was a positive bias (winds overforecast) in all the 48 hr forecasts, and in the 24 and 36 hr forecast after 0600 UTC 18 August. This was due to Fernanda consistently weakening faster than forecast.

No watches or warnings were issued for Fernanda.

Table 1. Best track, Tropical Storm Fernanda, 17 -22 August 1999

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
17/0600	12.4	113.1	1008	25	tropical depression
1200	12.8	114.1	1008	25	“
1800	13.3	115.2	1006	30	“
18/0000	14.0	116.5	1005	35	tropical storm
0600	14.7	117.7	1004	35	“
1200	15.3	118.7	1003	40	“
1800	15.7	119.6	1001	40	“
19/0000	16.0	120.4	1000	45	“
0600	16.3	121.3	997	50	“
1200	16.7	122.1	994	55	“
1800	16.8	122.8	997	50	“
20/0000	16.6	123.5	1001	40	“
0600	16.5	124.1	1003	35	“
1200	16.3	124.8	1004	35	“
1800	16.0	125.6	1005	35	“
21/0000	15.8	126.4	1006	30	tropical depression
0600	15.6	127.1	1006	30	“
1200	15.3	127.9	1006	30	“
1800	15.0	128.6	1006	30	“
22/0000	14.6	129.3	1006	30	“
0600	14.3	129.8	1007	25	“
1200	14.1	130.2	1007	25	“
1800	13.8	130.6	1008	25	“
23/0000					dissipated
19/1200	16.7	122.1	994	55	minimum pressure

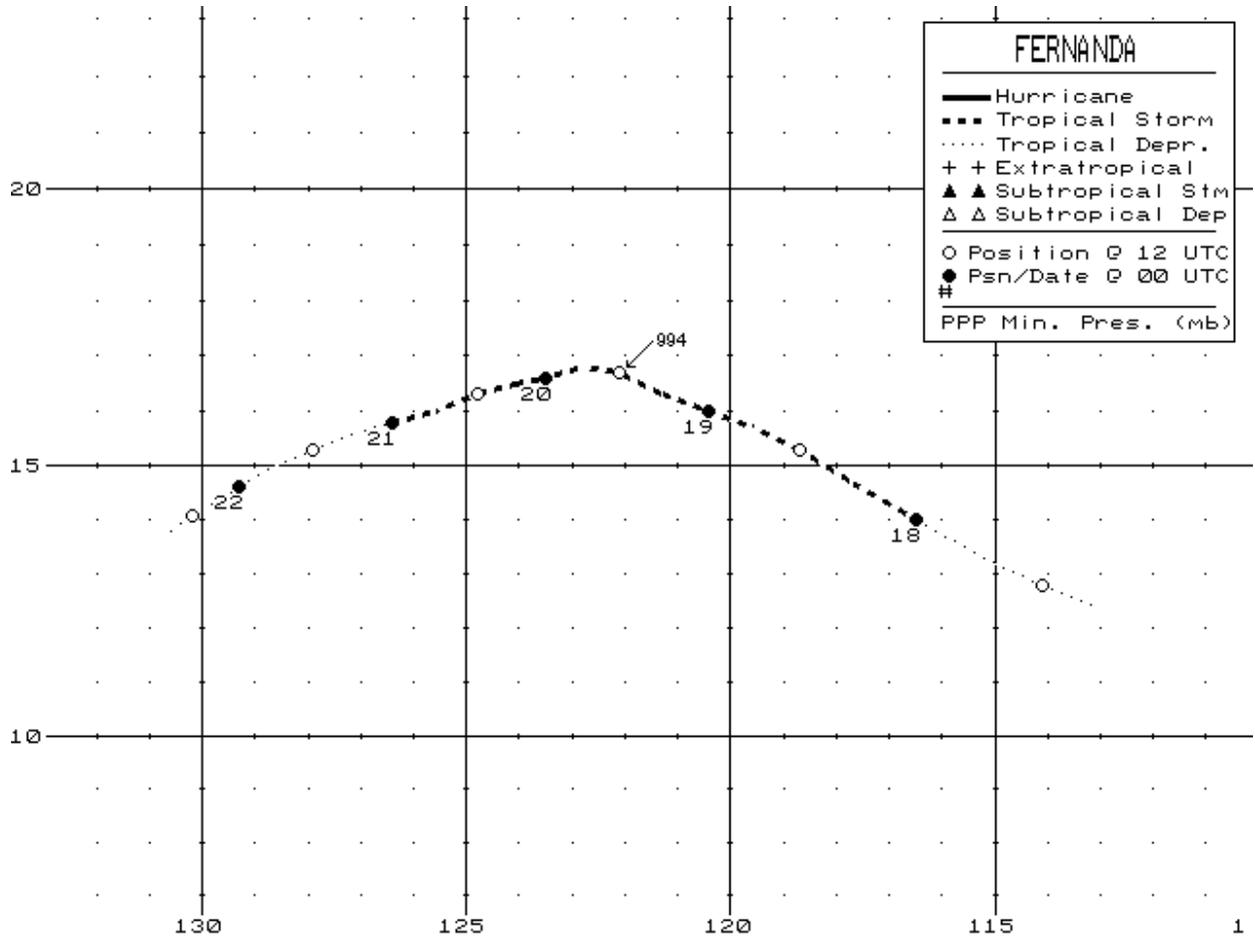


Figure 1. Best track positions for Tropical Storm Fernanda, 17 - 22 August 1999.

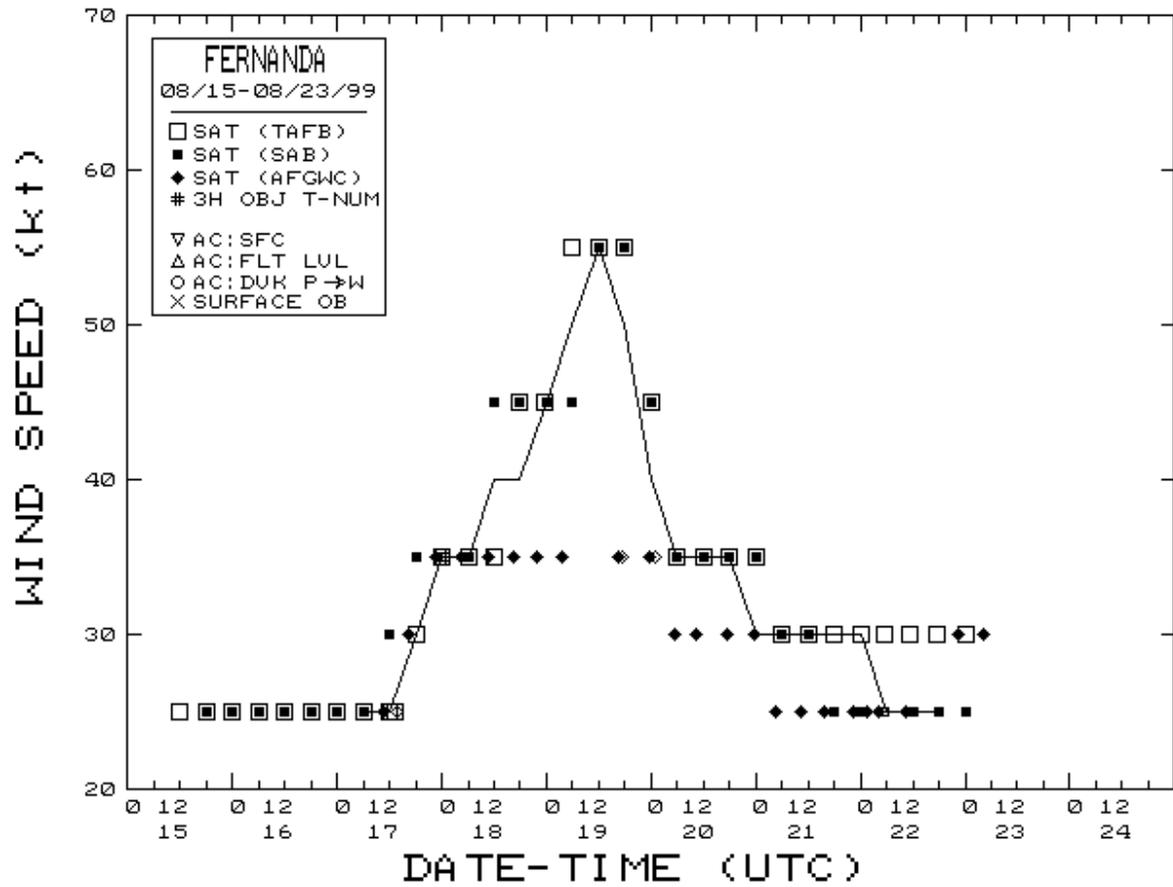


Figure 2. Best track maximum sustained wind speed curve for Tropical Storm Fernanda, 17-22 August 1999..

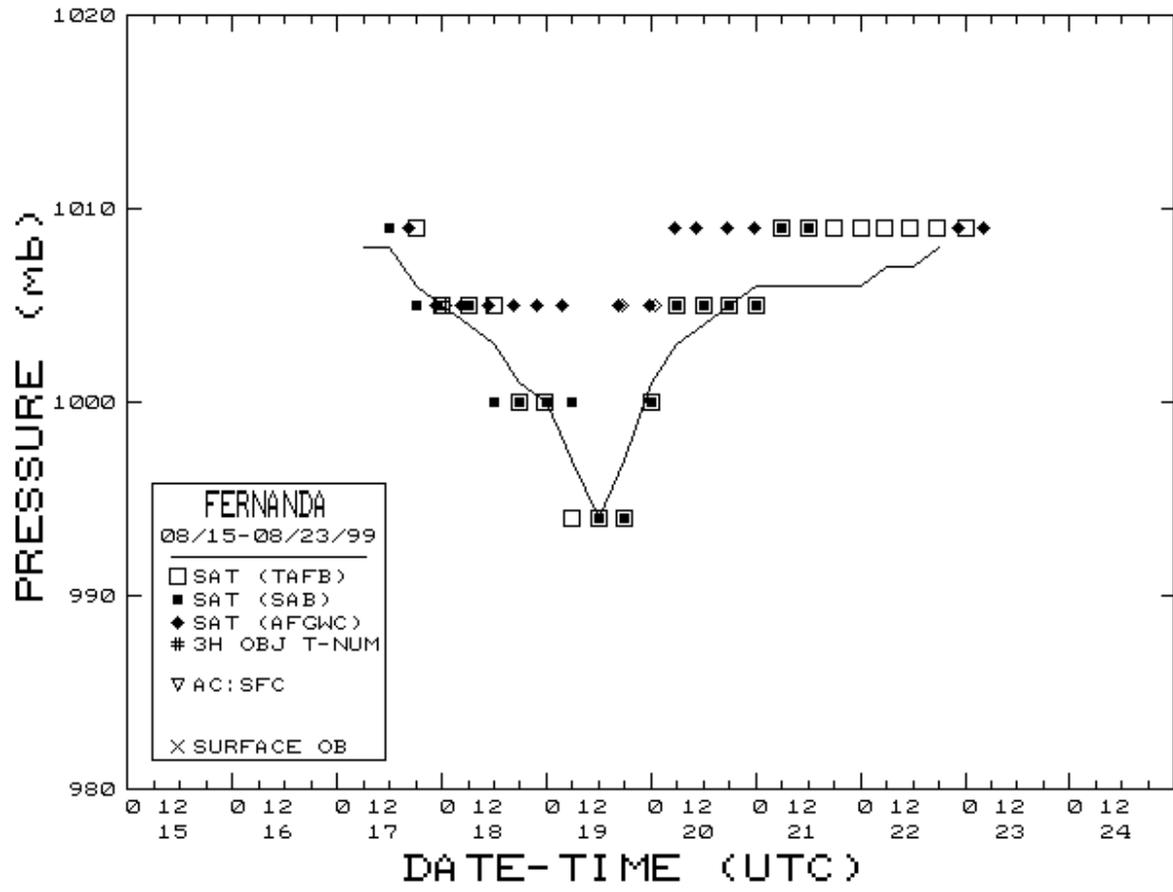


Figure 3. Best track minimum central pressure curve for Tropical Storm Fernanda, 17-22 August, 1999.